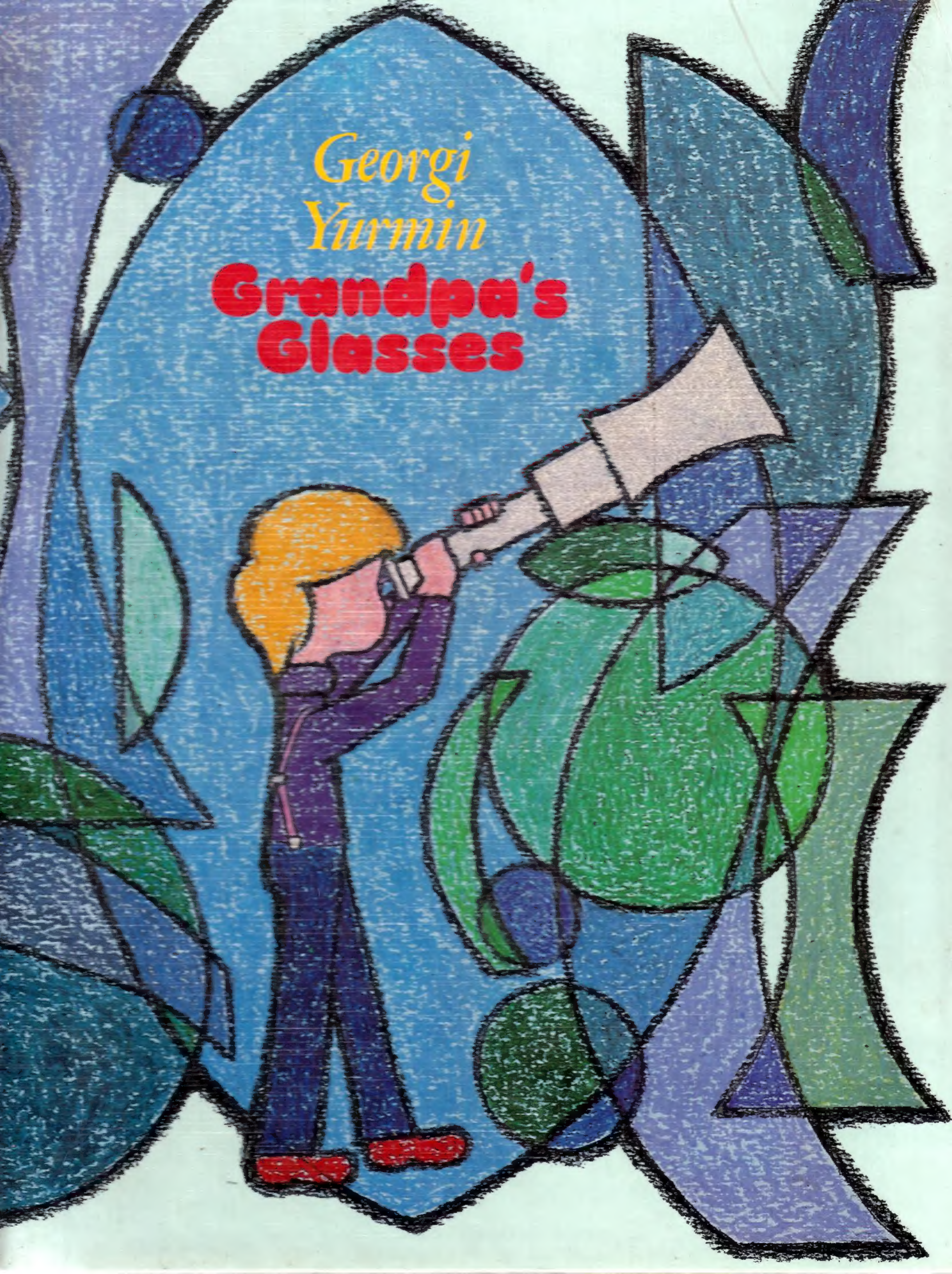
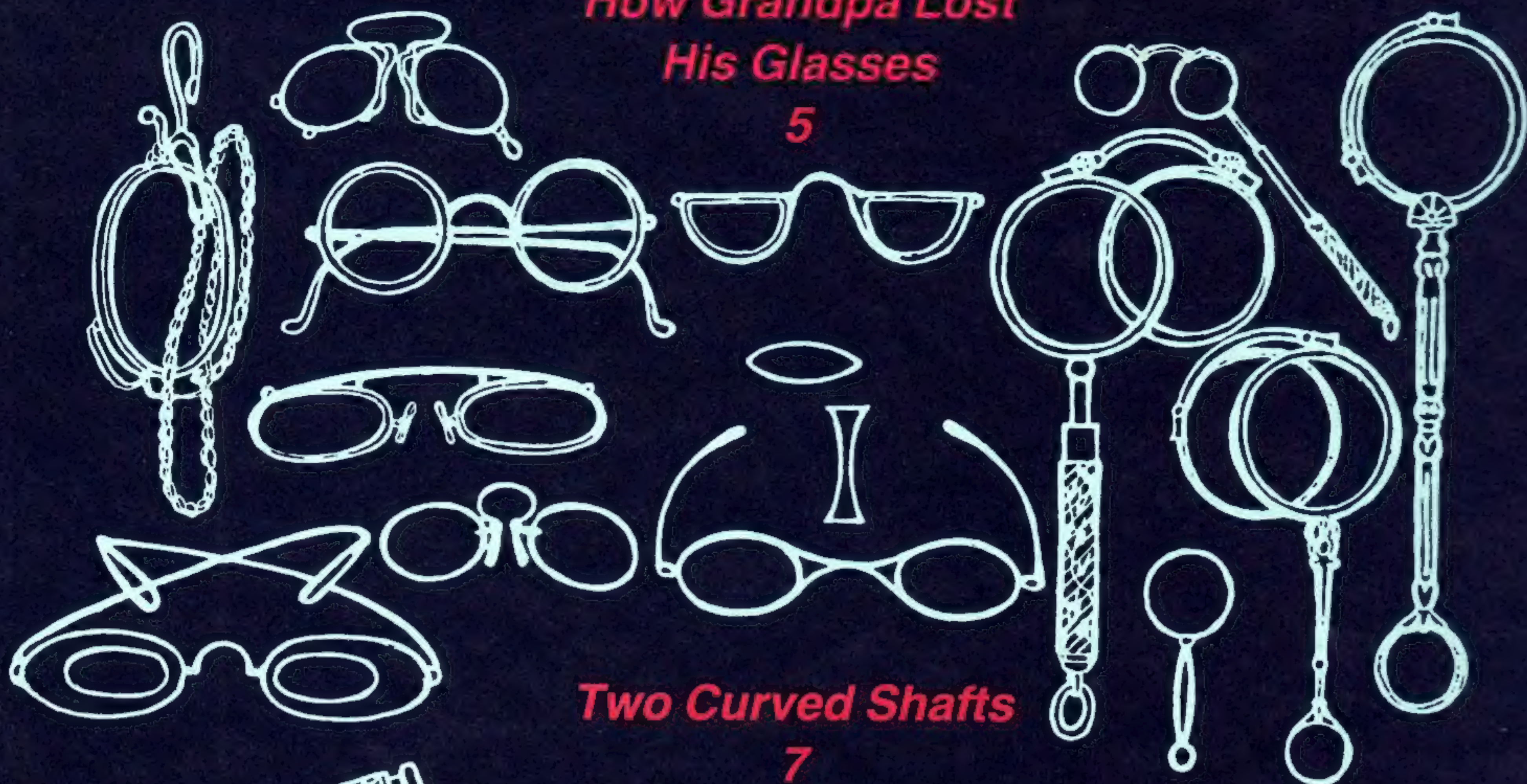


*Georgi
Yurmin*
**Grandpa's
Glasses**



How Grandpa Lost His Glasses

5



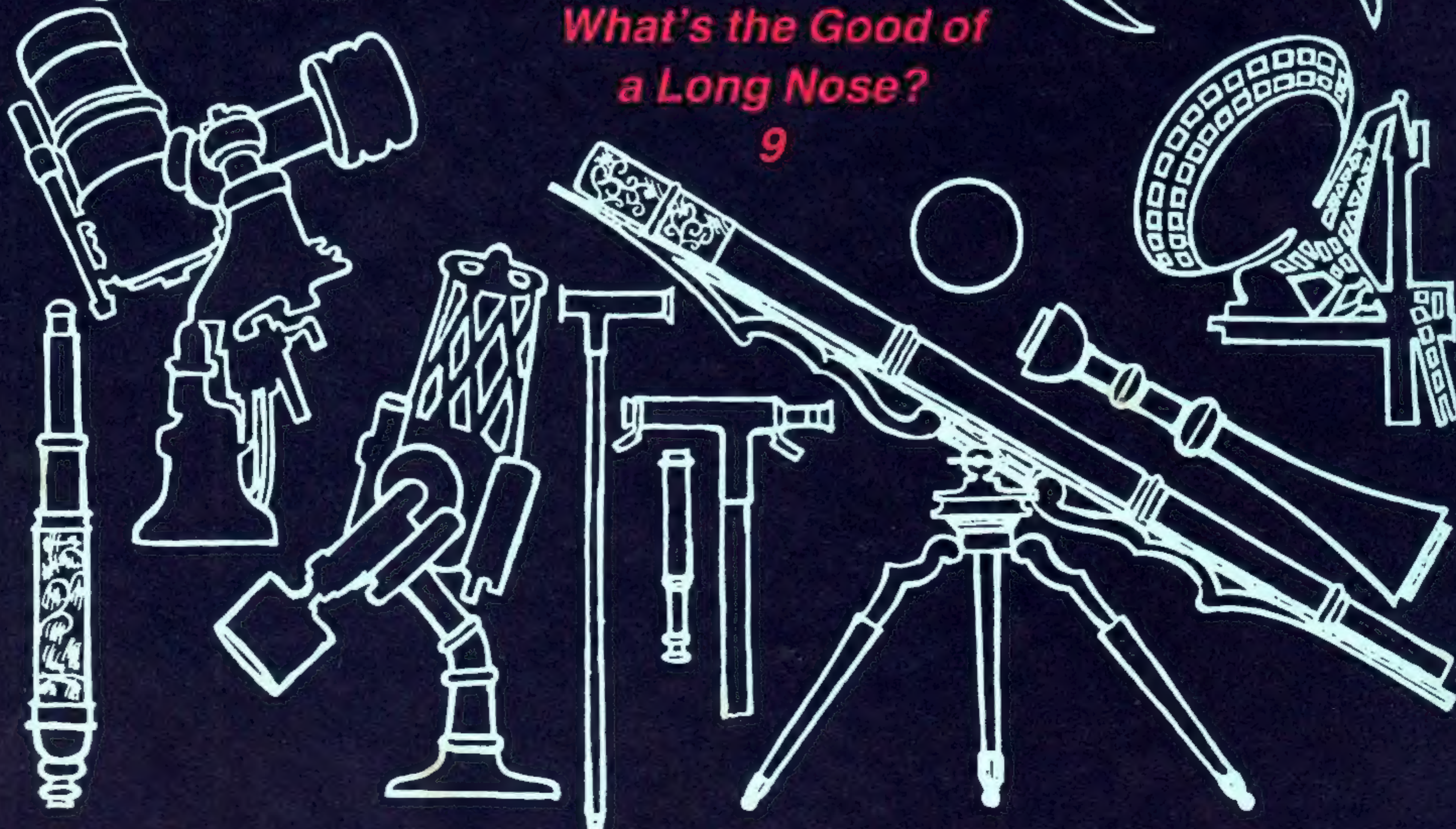
Two Curved Shafts

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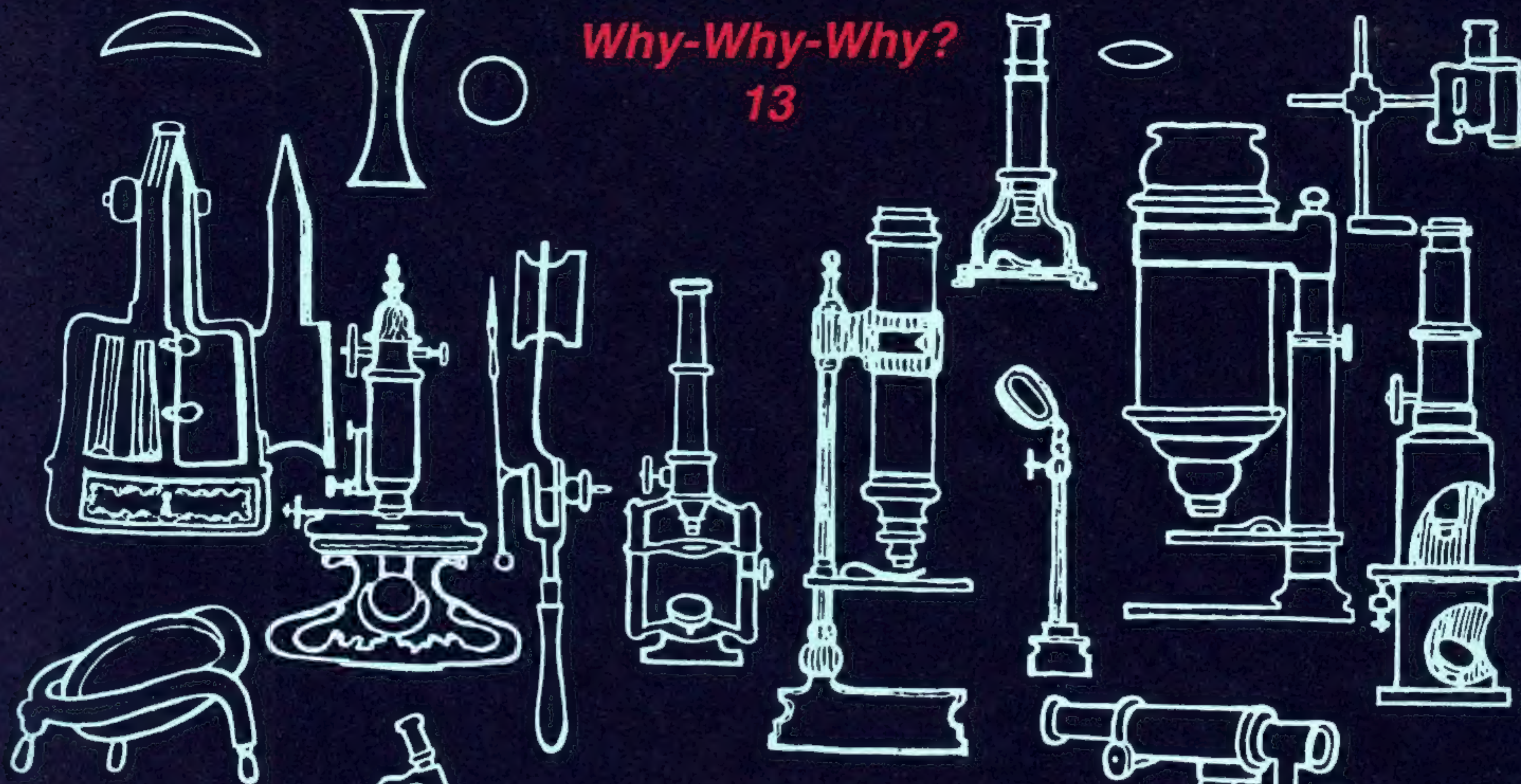
What's the Good of a Long Nose?

9



Why-Why-Why?

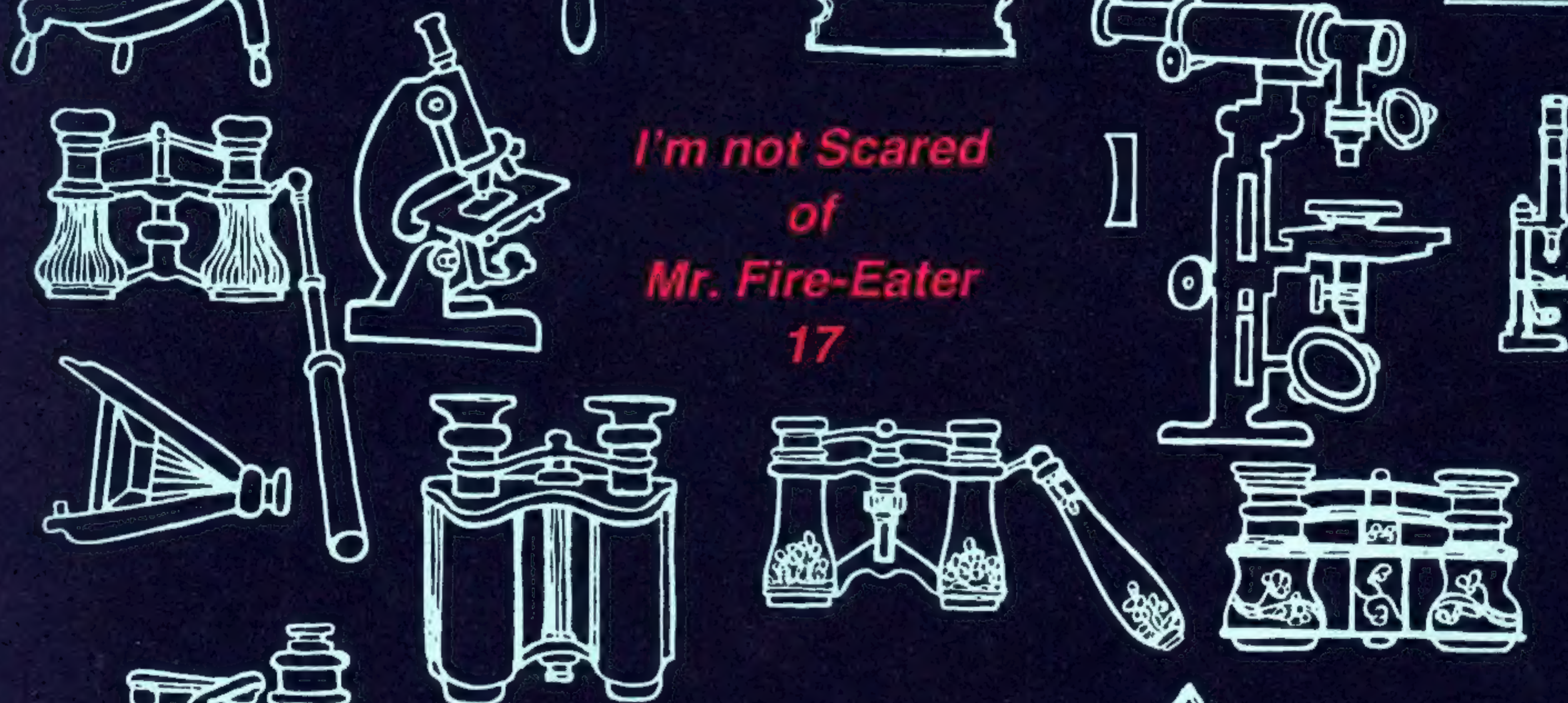
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I'm not Scared
of

Mr. Fire-Eater

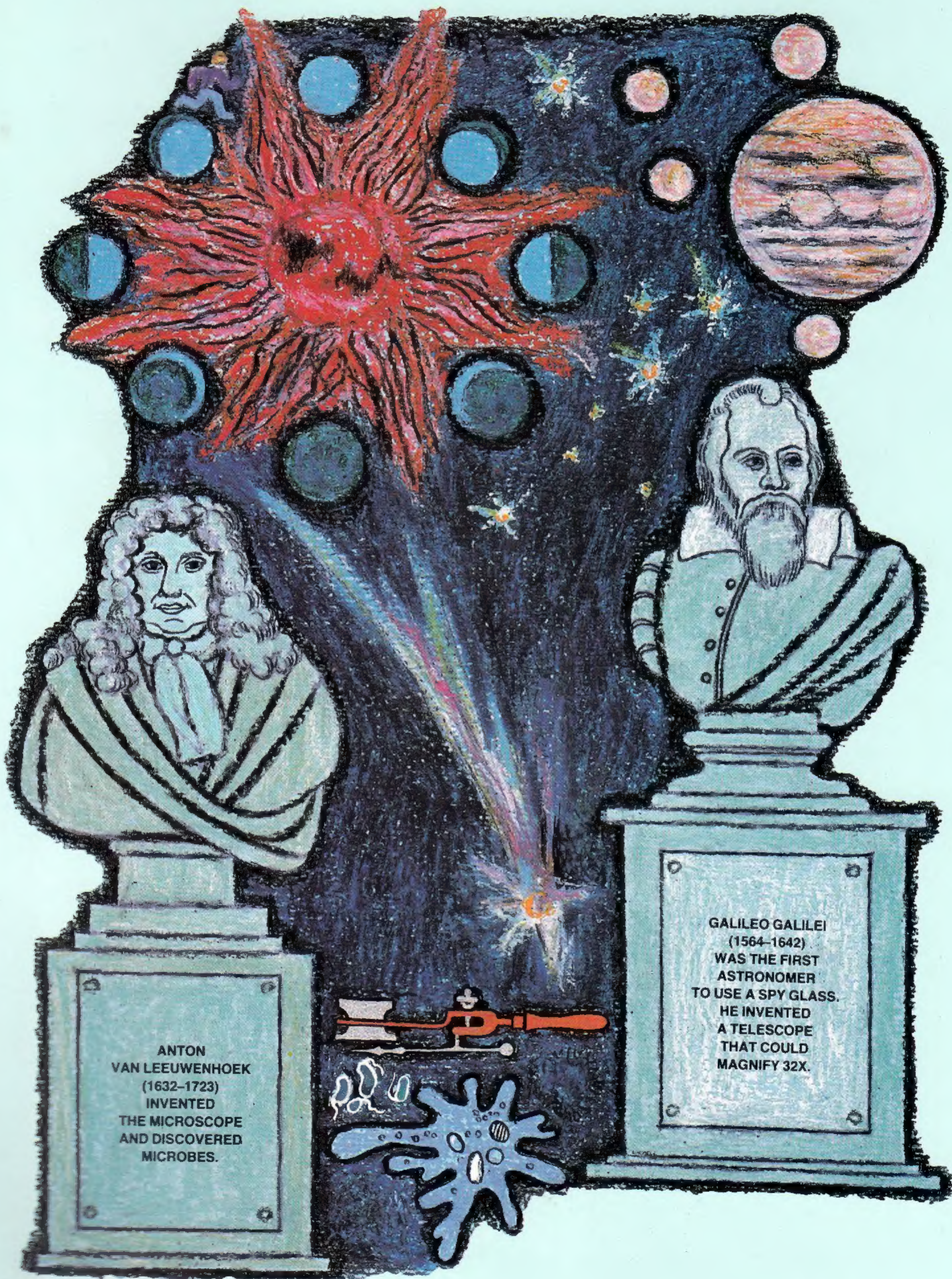
17



Which
Glasses Are Best?

19





ANTON
VAN LEEUWENHOEK
(1632-1723)
INVENTED
THE MICROSCOPE
AND DISCOVERED
MICROBES.

GALILEO GALILEI
(1564-1642)
WAS THE FIRST
ASTRONOMER
TO USE A SPY GLASS.
HE INVENTED
A TELESCOPE
THAT COULD
MAGNIFY 32X.

*Georgi
Yurmin*

**Grandpa's
Glasses**

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by FAINNA SOLASKO*

*Illustrations
by IRINA KISELEVSKAYA*



**Raduga Publishers
Moscow**



How Grandpa Lost His Glasses

My grandpa's hair is very white.
"Why is your hair so white?" I said.

"Time has made it white."

Grandpa is stoop-shouldered.

"Why's your back bent like that?" I said.

"Time has made it like that."

Grandpa's eyes are very kind. There are tiny wrinkles all around them. Time must have put them there, too. Grandpa always wears a pair of shiny-rimmed glasses.

"Why do you wear glasses, Grandpa?" I said.

And he replied in a deep gruff voice like the wolf's in "Little Red Riding Hood": "The better to see you with, my dear. Time has made my eyes very dim."

Then one day Grandpa said: "D'you know where my specs are?"

What a funny thing to say! What kind of specks was he talking about?

"I mean my glasses," he said and chuckled when he saw how surprized I looked.

I helped him search for them. We looked everywhere. Then I looked at Grandpa and saw he was wearing them!

"Well," he said, "I guess Time has run off with my memory, too."

A few days later he really did lose his glasses. We looked high and low, but couldn't find them. They weren't on the table, or under the table, or on the shelf. And he wasn't wearing them, either. Where could they be?

"How will you read the papers now, Grandpa?"

"I'll borrow Grandma's glasses. Maybe they'll fit."

But they didn't. In fact, he was better off without them. That's because everybody's eyes are different, and the lenses in people's glasses are all different, too. What was just right for Grandma was no good for Grandpa. And what was good for him was no good for her.

"How will you read the papers now, Grandpa?"

"I'll just have to do what people did in olden times till we find my glasses."

"What did they do?"

"This is what." And Grandpa got out a large magnifying glass set in a plastic rim. He began moving it back and forth across the rows of print. The letters on the page in the newspaper were like tiny black ants, but when he held the magnifying glass over them each became as big as a beetle.

"What a bother!" Grandpa grumbled as he squinted his left eye and moved the magnifying glass across the lines. "We'd better find my glasses soon."

I felt sorry for Grandpa. He was really having a hard time reading like that, so I started hunting for his glasses again. And I found them!

They were hiding between the pages of a book he'd been reading, and they hadn't peeped out once in all the time we'd been searching for them.

"Grandpa! I found your glasses!"



Two Curved Shafts

"I guess I'm in trouble again," Grandpa said. "The shafts that held up the wheels cracked."

What shafts was he talking about? And what wheels? Then I remembered the riddle he'd once asked me, and I knew what he meant.

This is the riddle:

What has two shafts that go behind your ears, two wheels in front of your eyes, and a saddle for the bridge of your nose?

Can you guess?

I did, and I shouted: "It's a pair of glasses!"

The ear-pieces that looked like wagon shafts had cracked. That's why the lenses that looked like wheels kept slipping down Grandpa's nose.

"What'll we do?" I said.

"Don't worry," Grandpa said. "We'll take them to the repair shop and have them fixed. But meanwhile, we'll do what people who wore glasses did in olden times".

Grandpa tied a shoelace to the curved end of each ear-piece, put on his glasses, drew the laces behind his head and tied a bow in back. Then he picked up his paper.

"Is that how people wore glasses in olden times?" I said.

"Not really, but it was the same general idea. The lenses and the nose-piece were attached to a hat, and you had to put on the hat if you wanted to wear them. You could also have a pair of lenses that were set in a strip of leather which you tied around your head like a

ribbon. A court physician invented the leather eyeglass-ribbon.

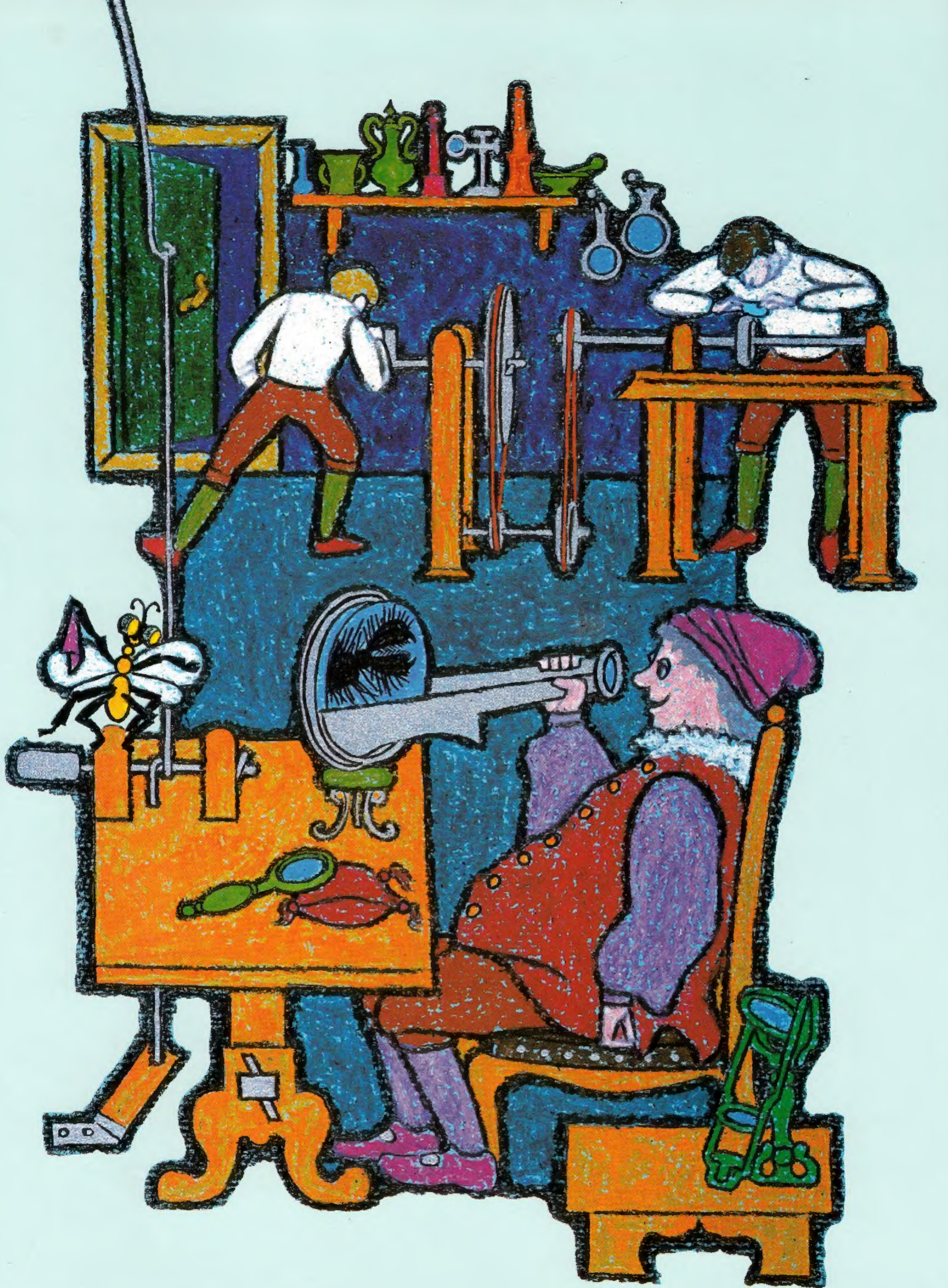
Whenever the king's eyeglass-hat would slip, and it kept slipping all the time, he would fly into a rage. But he was very pleased with his new leather eyeglass-holder and thanked his physician royally. When the court physician died, the king had his tombstone engraved with gold lettering that read: "Here lies Salvino Armati, inventor of the eyeglass. God forgive him his trespasses."

Grandpa told me all this and went back to his paper, but he didn't have much of a chance to wear his glasses like that king of olden times did. He soon got tired of pushing the glasses up on his nose, for the laces kept slipping down and the bow kept getting loose. When the laces slipped for the tenth time, Grandpa said:

"Let's go to the repair shop. I don't want them to fall off and break."

Now Grandpa has two curved shafts that go behind his ears, and his glasses don't slip off any more.





What's the Good of a Long Nose?

Imagine! I was only three yesterday, but today I'm four years old! I've become a year older in just one day. That's because today is my birthday. And what a very special day it is. Everyone has a present for me.

Mama gave me a big drawing pad and a box of paints for my birthday. Papa gave me a ball and a book called "Pinocchio". But Grandpa didn't buy me anything. He poked around in his sea chest and took out an old spyglass which his papa had given him years and years ago.

"Here," he said. "This is for you. Now my glasses will serve you."

"Oh, thank you, Grandpa. But why did you say 'glasses'? This is a spyglass."

"Yes, it is. And the reason it's called that is because long ago 'to spy' meant to see. To see very well. And I'll tell you something else. If not for plain old eyeglasses, the spyglass would never have been invented."

This is the story Grandpa told me.

Once upon a time, long, long ago, there was an eyeglass-maker. One day he picked up his magnifying glass and held it over a fly's foot. Seen through the glass, the tiny foot became thick and hairy-looking. That's what a single lens could do.

"Now what if I take two or three lenses and hold one over the other?" he said to himself. "Why, they'll probably make the fly's foot look even bigger!"

And that's just what he did. Sure enough, that's exactly what happened. However, it was not easy to balance two or three magnifying glasses at once. If

only he could make a double or a triple pair of eyeglasses, his hands would be free to do their work. But who ever heard of a nose so long that three pairs of eyeglasses could perch on it in a row like sparrows on a branch?

"I'll have to manage without a long nose," the eyeglass-maker said to himself. "But how?"

He sat there thinking for a long time and finally thought of a way to do it. He found a piece of metal pipe small enough for the three little round lenses to fit snugly inside.

And that is how the first spyglass was made.

Captains of sailing ships were very pleased to have such a wonderful tool, for they could look into it and see far across the sea, spying land in the distance, or other sailing ships that looked just like tiny black specks if you had no spyglass.

"Look in your spyglass and tell me what you see," Grandpa said to me.

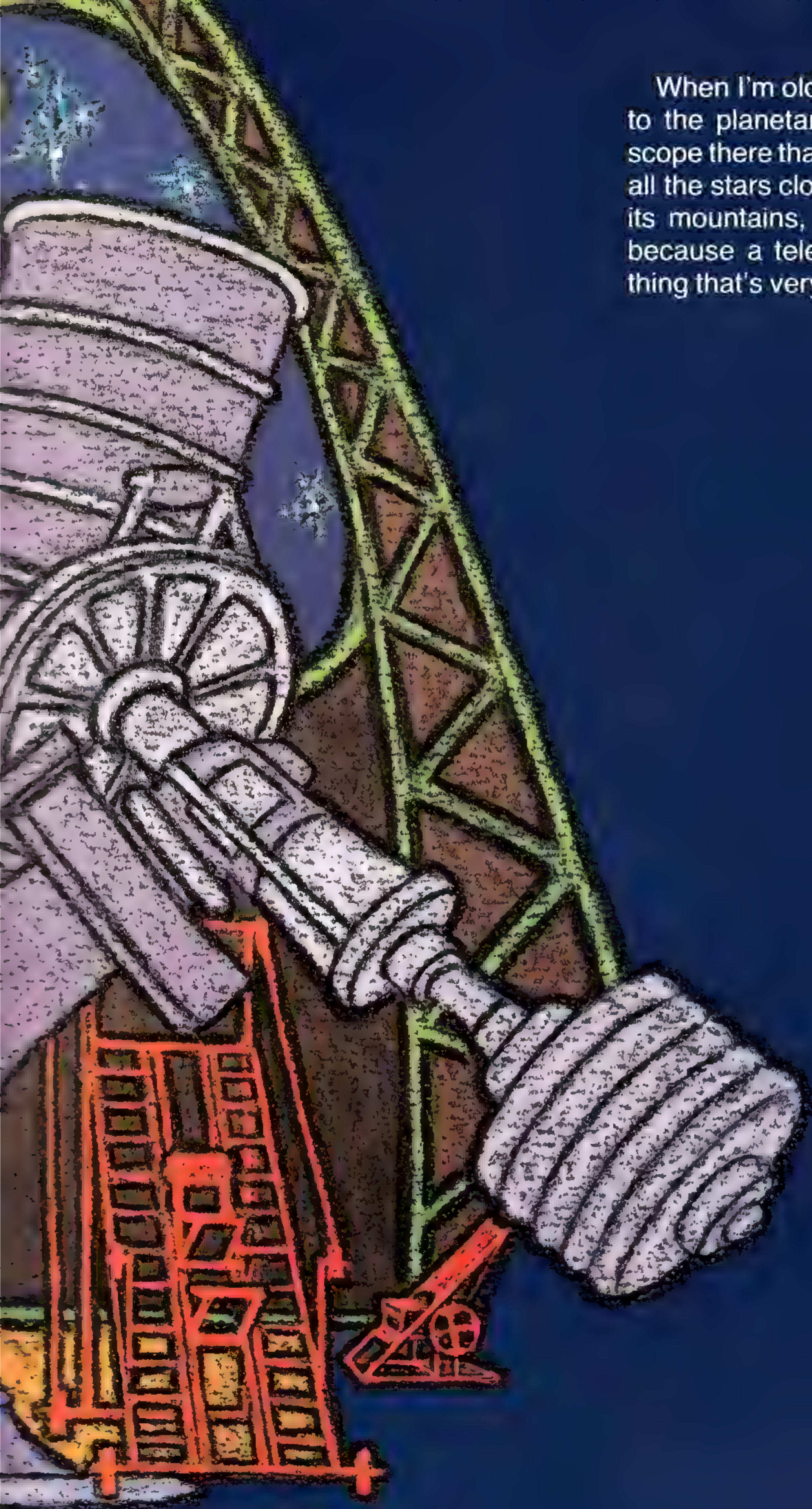
So I went over to the window, raised my spyglass and looked out. Whenever I spied something of interest, I'd shout: "There's a plane! There's a sparrow cleaning its bill!"

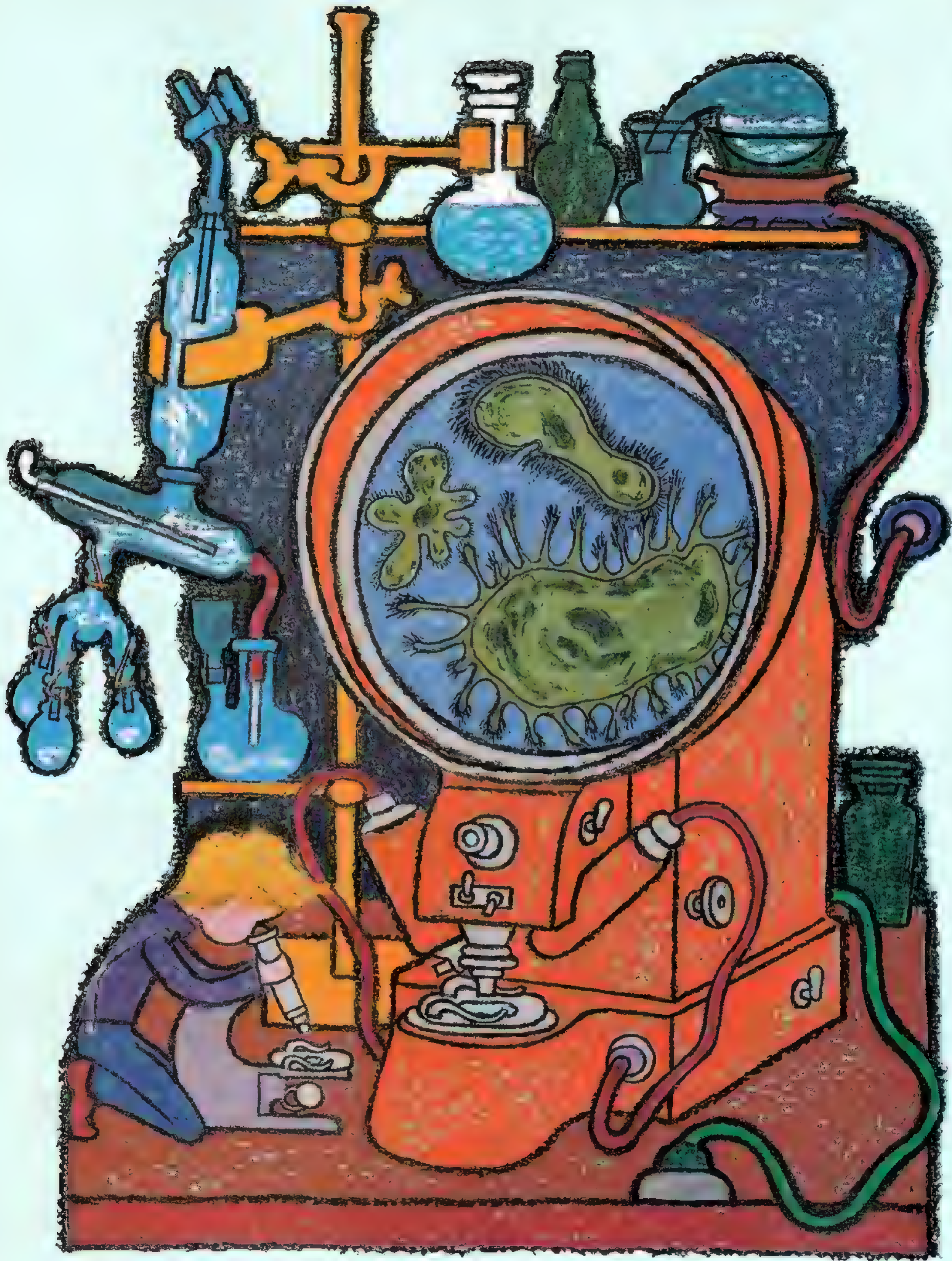
My spyglass is wonderful. It's like having another pair of eyes. Still, it's much less powerful than a telescope. I know, because Grandpa told me all about telescopes, too.

A telescope is really just a very big, very heavy spyglass that looks like a cannon. It's mounted on a big stand, too. Telescope lenses are so powerful they make tiny twinkling stars look big.



When I'm older, Grandpa will take me to the planetarium. There's a big telescope there that you can look into. I'll see all the stars close up, and the Moon and its mountains, deserts and dead seas, because a telescope can make everything that's very far away seem close.





Why-Why-Why?

There were so many things I had to ask Grandpa about:

Why do cats meow?

Why does the wind blow?

Why do I have freckles?

Why-why-why?

"All you do is ask questions all day long," Grandpa said.

It surprises me, too. I never know when I'll open my mouth and hear myself saying: "Why?"

Take today, for instance. Grandpa said something about his glasses, and I said: "Why glasses?"

"Because the lenses are made of glass."

Then Grandpa said: "We're going to see Yura's teacher after school today."

"Why?"

"Because your brother got another D."

While Grandpa was busy talking to Yura's teacher in the empty classroom, I decided to have a look around. I went down the corridor opening doors. I saw a little pipe on a stand in one of the empty classrooms.

Grandpa was looking very upset after his talk with Yura's teacher. The first thing I said to him when he came up to me was:

"Why's this little pipe set on a stand?"

"It's not a pipe on a stand. It's a microscope. It magnifies things. You can even see things that are invisible. Want me to show you?"

What a question!

Grandpa asked Yura's teacher for permission to let me look into the microscope.

A microscope is a tiny spyglass. It's set on a stand and has a lens on the bottom that's placed over a tiny table with a hole in the middle. There's a round mirror under the tiny table.

Grandpa picked up a narrow little strip of glass, put a drop of water from a bottle nearby on the glass, then placed the glass strip on the tiny table under the microscope so that the drop was directly over the round hole in the middle. Then he bent over, pressed his eye to the top of the little pipe and began moving the mirror up and down.

"Why are you moving the mirror?" I asked.

"To catch a sun spot and direct it towards the drop. You won't see a thing otherwise. Ah! Here it is. Come, have a look at the drop. No, not through the microscope. First just have a look at it."

I looked at the drop. It was an ordinary drop of water. Then I looked at it through the microscope and caught my breath. It was gone! All I saw was a sea of water. Hairy, whiskered monsters were swimming around in the sea.

The whiskered beasts were called slipper limpets. Grandpa said they weren't dangerous at all, but that invisible microbes are. Microbes are often very dangerous. If you drink dirty water, you swallow a lot of microbes, and some of them can make you very sick.

All the way home I kept thinking about microbes and the microscope. Then I began thinking about my brother Yura. What if he'd swallowed some D-microbes and they were making him study



Camera for
photo-
micro-
graphy

Microscope for
2 viewers

Microscope
on a brass
stand
1740s

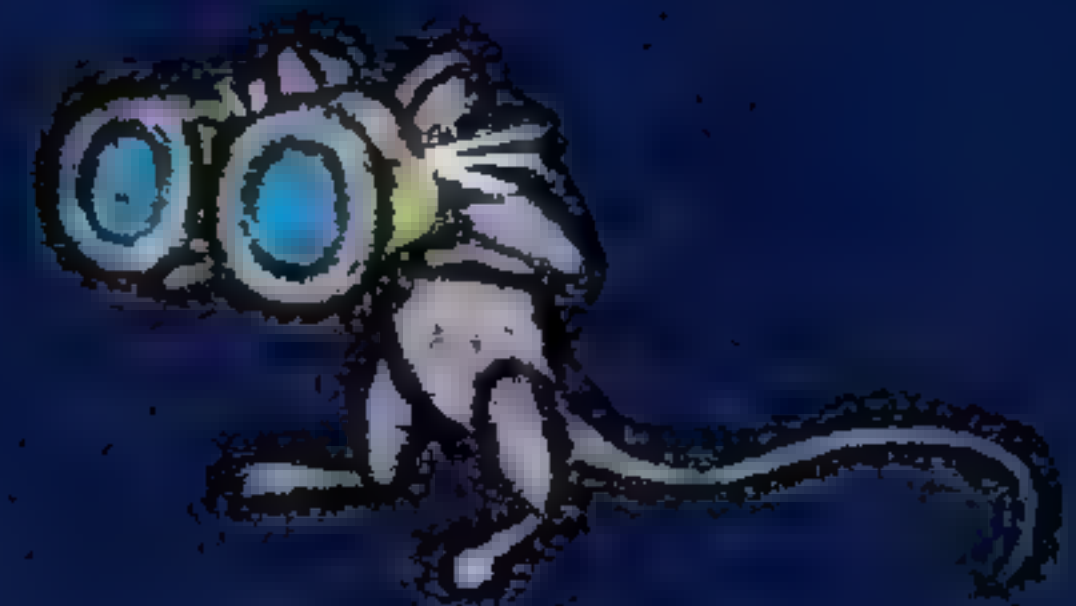
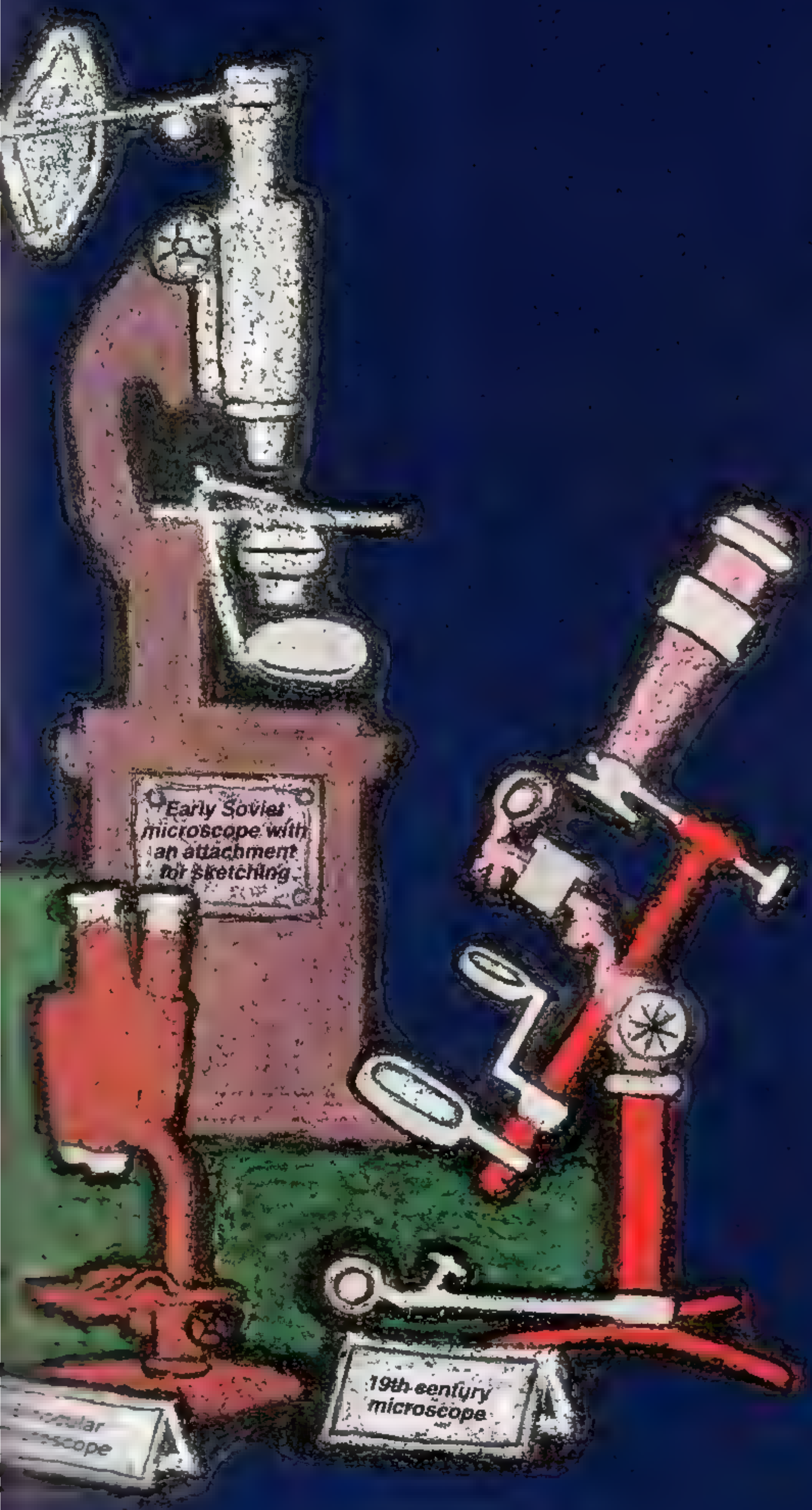
Baer's microscope
19th century

Magnifier, 1860s

so poorly? What if Yura could be put on a strip of glass and examined through a microscope? Then, if there were any D-microbes in him, he could be cured.

I asked Grandpa if that could be done. Grandpa laughed and said:

"Yura's no drop of water, or flower petal, or fly's foot, or bit of leaf. People are too big to be examined through a microscope. But you can examine a hair, or a sliver of nail, or a drop of blood through a microscope. You don't need a microscope to see that Yura has some D-microbes in him. But you just wait and see, we'll cure him!"





I'm Not Scared of Mr. Fire-Eater

The characters in the book my daddy gave me for my birthday are a wooden boy named Pinocchio, his friends — the marionettes Malvina, Pierrot, and Artemon the poodle — and his enemies — Mr. Fire-Eater, the Fox, and the Cat.

I'd only seen pictures of them before, and then one day Grandpa took me to the Children's Theatre. That's when I saw all of them for real.

We had awful seats in the very last row. All the other children would laugh at Pinocchio's pranks and get mad at horrible old Mr. Fire-Eater, but I just sat there, trying to figure out what was happening on the stage.

Then Grandpa handed me his glasses, and everything became as clear as day. I don't mean his spectacles with the curved shafts. I mean his opera glasses.

They were made of two short, stubby pieces of pipe with a crosspiece in the middle. There were lenses in them, too: small ones at one end and bigger ones at the other.

At first, Grandpa had a look at the stage. Then he handed me the opera glasses. Now I'd see everything, too! I peered through the smaller lenses, just like he'd done, but I couldn't see a thing! Nothing but two big blurs, with something blurry moving around in them. Were the blurs Malvina and Pinocchio?

Grandpa saw me fidgeting and whispered, "Turn the little wheel in the middle. Then you'll be able to see clearly."

I did, and the two blurry circles merged. And there was Pinocchio, as clear as day and as big as life.

But I soon became very frightened. There was Mr. Fire-Eater's hairy, scary, horrible face staring at me. I shut my eyes tight and said, "Here, Grandpa. I don't want your glasses any more. He's too scary."

"Turn them around and look at Mr. Fire-Eater through the bigger end," Grandpa said.

So I turned the glasses around. As soon as I did, old Fire-Eater moved far, far away. He became as tiny as a flea.

That's how I watched the rest of the performance: I'd look at the ones I liked — at Pinocchio, Malvina and Artemon — through the small lenses, making them as big as life, and at the ones I didn't like — at Mr. Fire-Eater, the Fox and the Cat — through the big lenses at the other end, making them all as tiny as fleas.

"Aren't you a clever boy," Grandpa said and smiled. Ever since then, whenever I behave badly he takes out his opera glasses and looks at me through the "bad people" end.

It makes me feel awful. So I say, "Don't be angry, Grandpa. I'll be good. Please look at me through the 'good people' end."



Which Glasses Are Best?

I was looking at the photographs in Grandpa's old album and came upon a picture of a brave-looking seaman. He had on an officer's cap with white edging and an anchor over the visor. There were little stars on his shoulder straps, and chevrons on his sleeves. And rows of medals on his chest.

"Who's this?" I said.

"You mean you don't even recognize your own grandfather?" Grandpa said.

I had another look and saw it really was him. It was Grandpa when he was young. His mustache was black, not gray like it is now. And there weren't any wrinkles in the corners of his eyes. But his eyes were just as merry-looking as they are now.

Young Grandpa on the picture was standing beside a tall pipe.

"What's this?" I asked.

"Why, that was my glasses, too. It served me all through the war when we were fighting the nazis. I was a lieutenant then and served on a submarine."

I kept at Grandpa, begging him to tell me all about it. At last, he gave in.

A submarine is a ship that sails underwater like a fish.

All the other navy ships — the cruisers, the battleships and destroyers — sail on top of the water and never under the surface, while a submarine spends most of its time under the water among the fishes. It can even settle on the bottom of the sea next to the starfish and the crabs, just lying there without even moving until it receives orders to surface again.

When a submarine is under the surface of the sea, no one can see it, but the men inside it can see everything. That's because a submarine has underwater glasses. These glasses are called a periscope.

A periscope is like a very long spy-glass. When the submarine is under the water, the lens at the top of its periscope rises up over the water. The man in the submarine puts his eye to another lens at the other end of the periscope and can see very far in all directions. The top lens can see everything above the water.

Grandpa served on a submarine all through the war. He was the man who was at the periscope.

One day the captain received orders to sink an enemy cruiser they had been hunting down for many days.

They put out to sea at dawn. Grandpa was at the periscope, turning it slowly in a circle, scanning the surface of the sea. There were no ships in sight, nothing but white-capped waves.

The next day he spotted a tiny speck on the horizon. The speck kept getting bigger and bigger as it got closer until at last it became a huge enemy cruiser. It was covered with heavy armor that only very heavy shells could pierce and had huge cannons sticking out in all directions.

"We've got you now!" Grandpa said to himself and ordered the torpedo men to get ready to fire.

Meanwhile, he kept sight of the cruiser through the periscope. When the torpedo man fired a torpedo, Grandpa





watched it zoom towards its target. There was a terrible explosion. The cruiser disappeared in a cloud of fire and smoke. It split in two and went down.

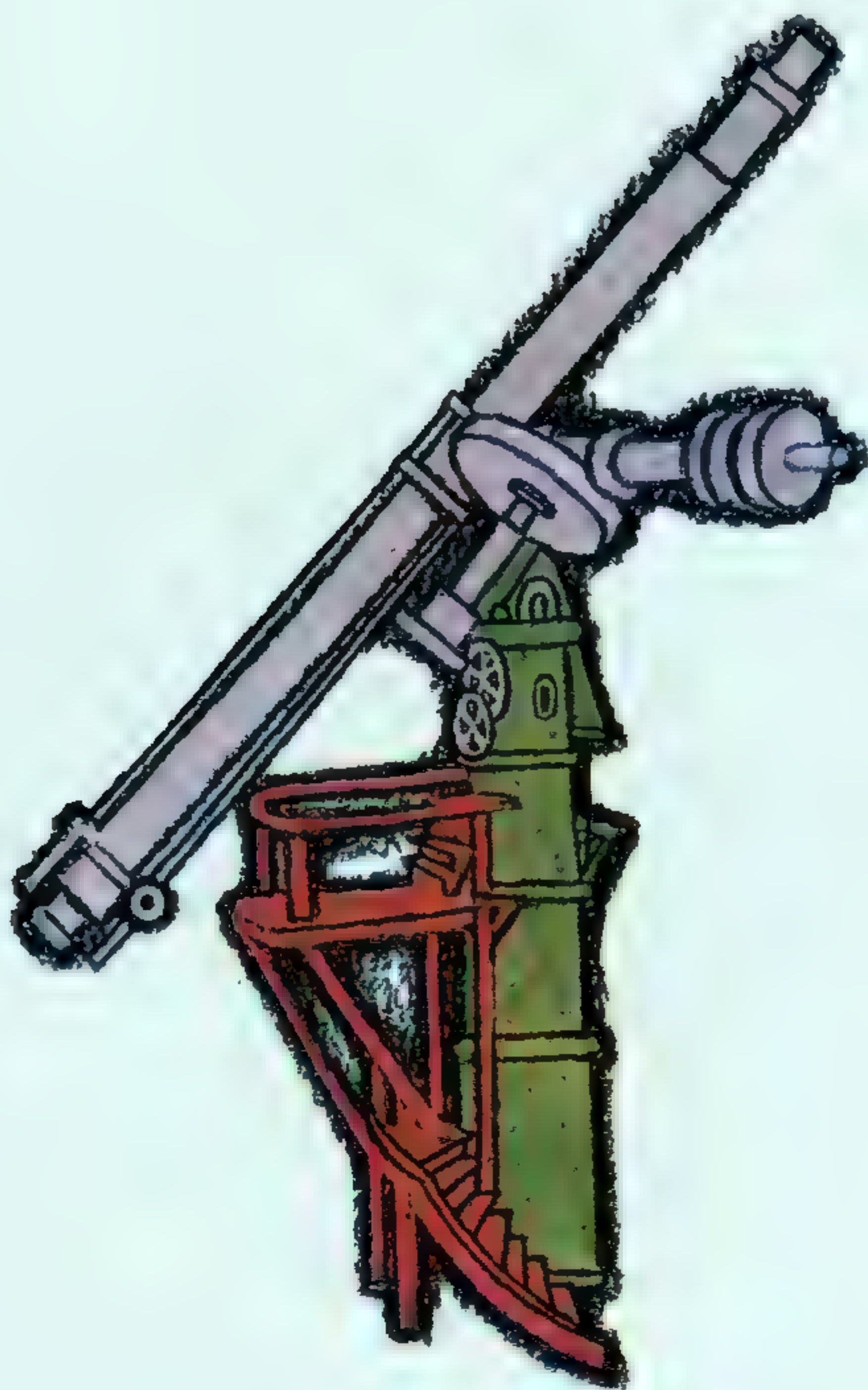
"This is my memento of that enemy pirate ship," Grandpa said and pointed to a large star among the medals on his chest on the old photograph.

I kept thinking about how wonderful a periscope was and decided I'd serve on a submarine, too, when I grew up. I'd man a periscope just like Grandpa used to do.

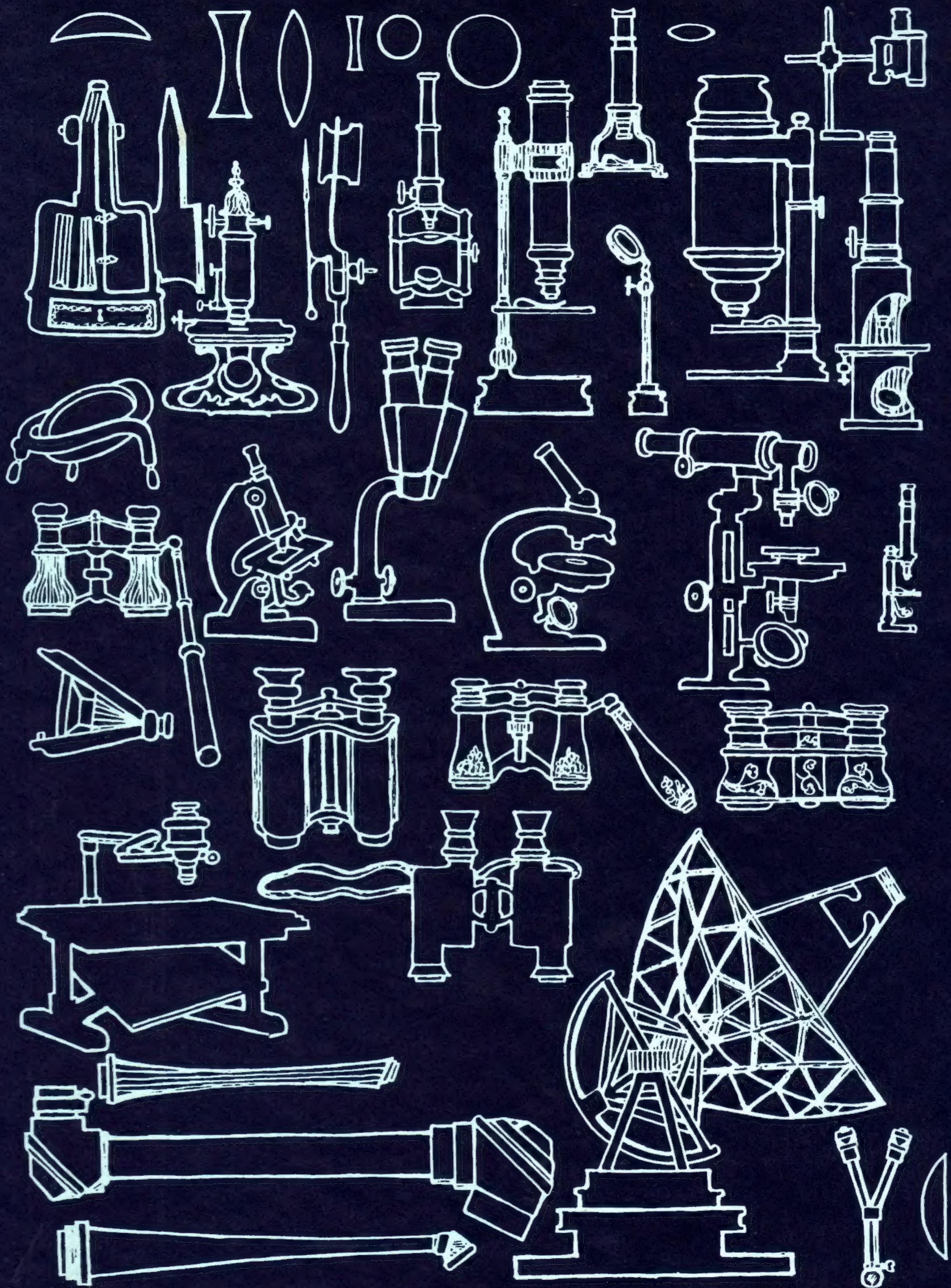
But what about looking at the stars through a telescope? That was very interesting, too.

And what about searching for invisible microbes through a microscope?

It's so hard to choose when they're all so interesting.









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